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DEVELOPMENT AND VALIDATION OF NEW DUAL-DOPPLER ANALYSIS TECHNIQUES WITH EMPHASIS ON THE VERTICAL VELOCITY PROBLEM

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LONG TERM GOALS

The development of new dual-Doppler analysis techniques with an emphasis on improving estimates of the vertical velocity field.

OBJECTIVES

The objectives are two-fold. The first objective is to tackle a problem of longstanding interest in radar meteorology, the determination of the vertical velocity field from dual-Doppler radar measurements. A second objective is to train a student of US citizenry in methods of conventional and new dual-Doppler radar analysis, and in general, how to perform original research and to think critically about scientific and technological problems.

APPROACH

The first phase of the work is the development of new techniques (based on variational methods and dynamical constraints) to analyze the wind and vertical velocity field from dual-Doppler radar data. The second phase of the work involves testing the new techniques on simulated radar data sampled from runs of a high resolution numerical weather prediction model, the Advanced Regional Prediction System (ARPS). The final phase of the work involves testing the methods with real Doppler radar datasets obtained, in part, from the Doppler-on-Wheels (DOW).

WORK COMPLETED

This past August, the first month of the grant, I recruited Paul Stanko to work on this Grant as part of his M.S. degree requirement at the OU School of Meteorology. As part of my training of Mr. Stanko (and with an eye on training other graduate students), I have written detailed notes for a lecture describing conventional dual-Doppler radar analysis, vertical velocity problem and the O'Brien method of adjustment. This October I had the opportunity to present this lecture to graduate students gathered in Taegu, Korea for a conference on mesoscale meteorology and radar meteorology (where I was an invited speaker on single-Doppler velocity retrieval).

RESULTS

No results are available at this stage.

RELATED PROJECTS

The ASSERT Grant is related to the parent grant funded by the DoD (ONR): "Remote Sensing and Prediction of the Coastal Marine Boundary Layer," Grant N00014-96-1-1112.